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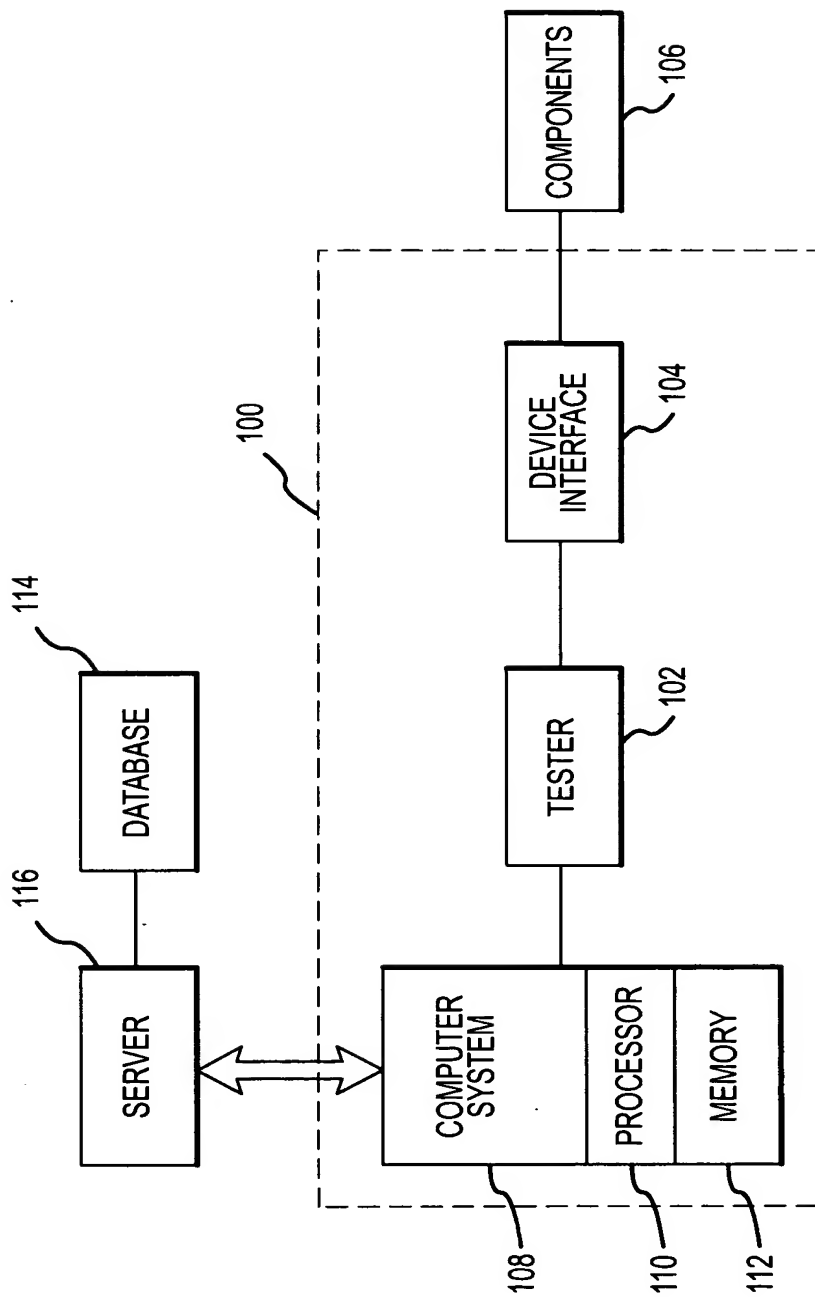


FIG.1

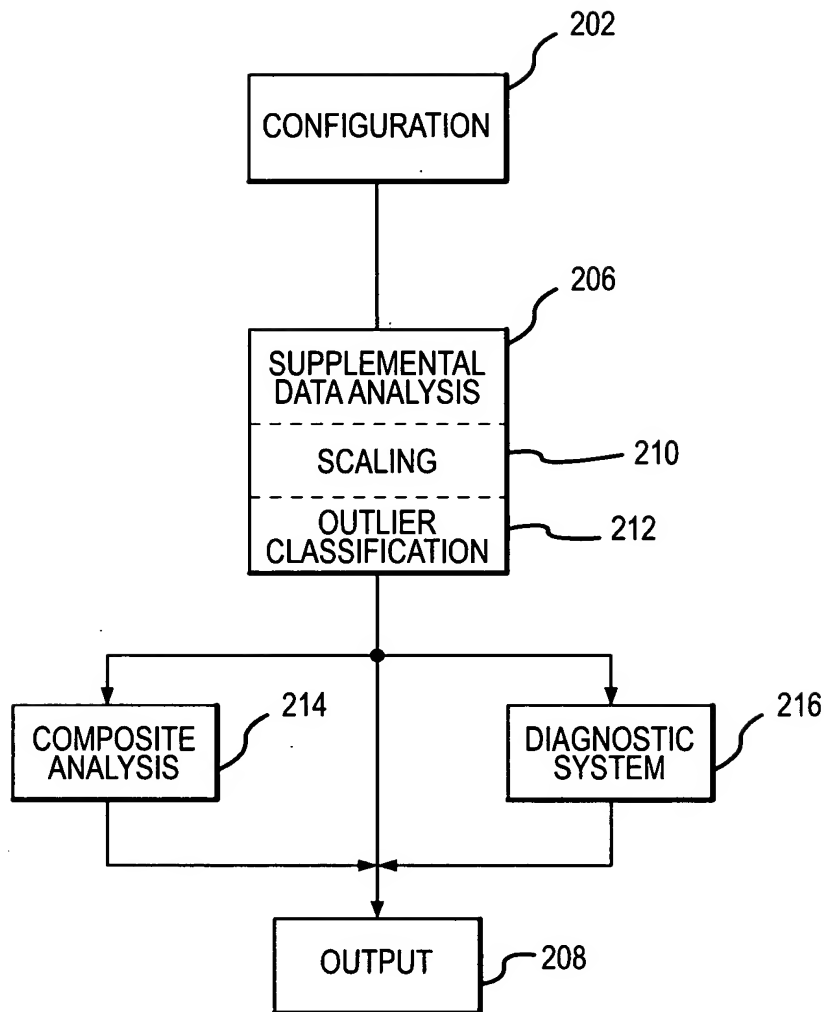


FIG.2

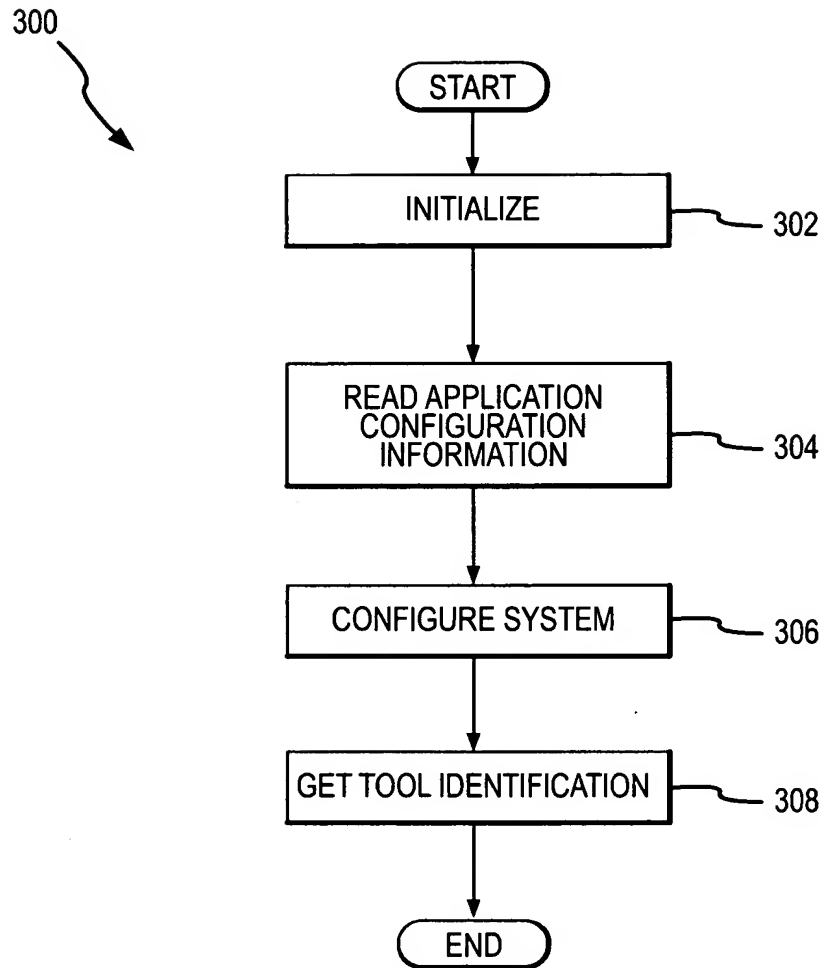


FIG.3

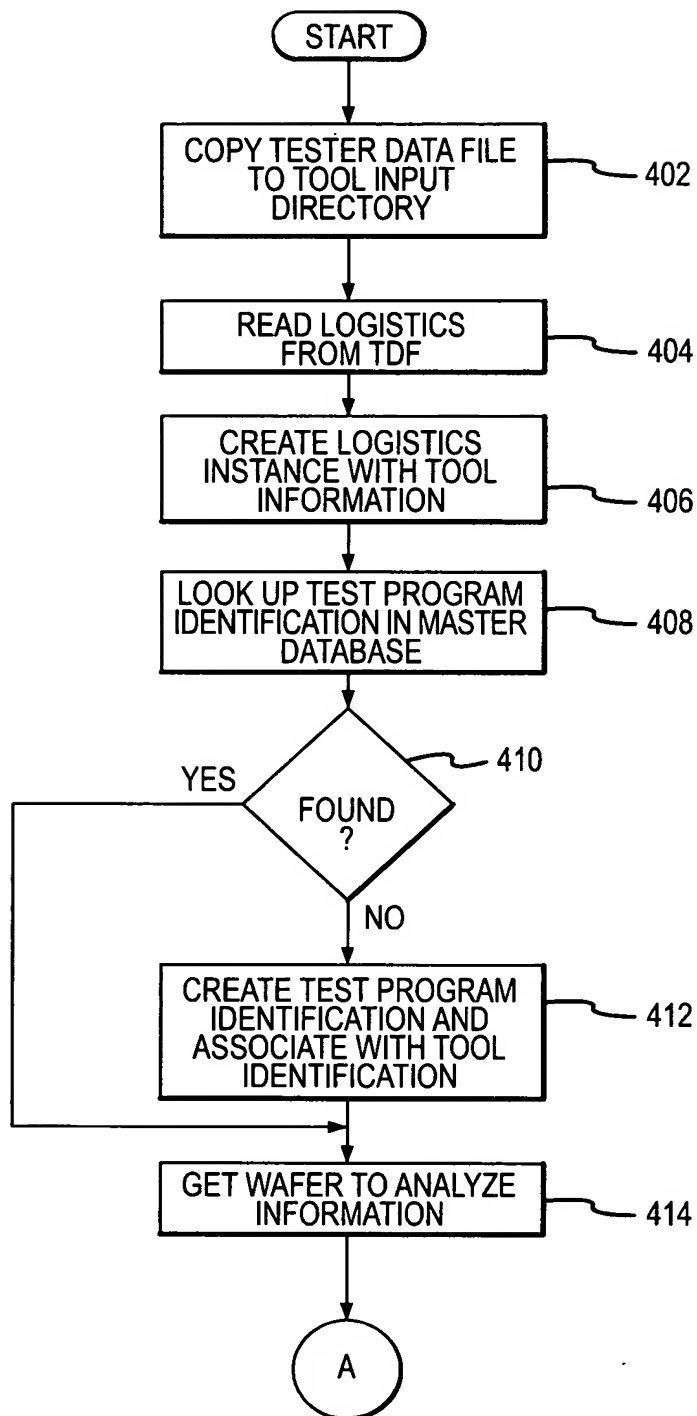


FIG.4A

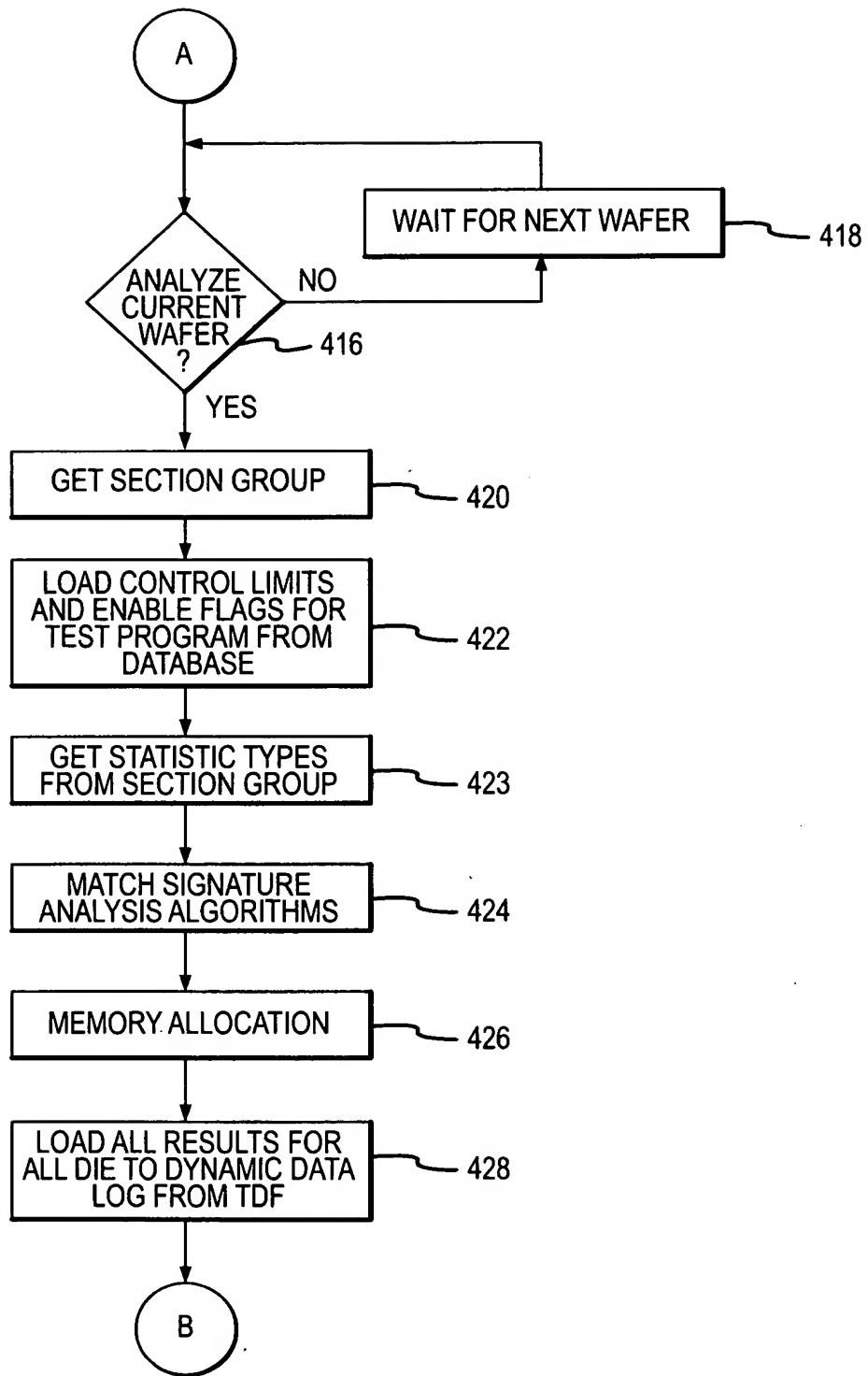


FIG. 4B

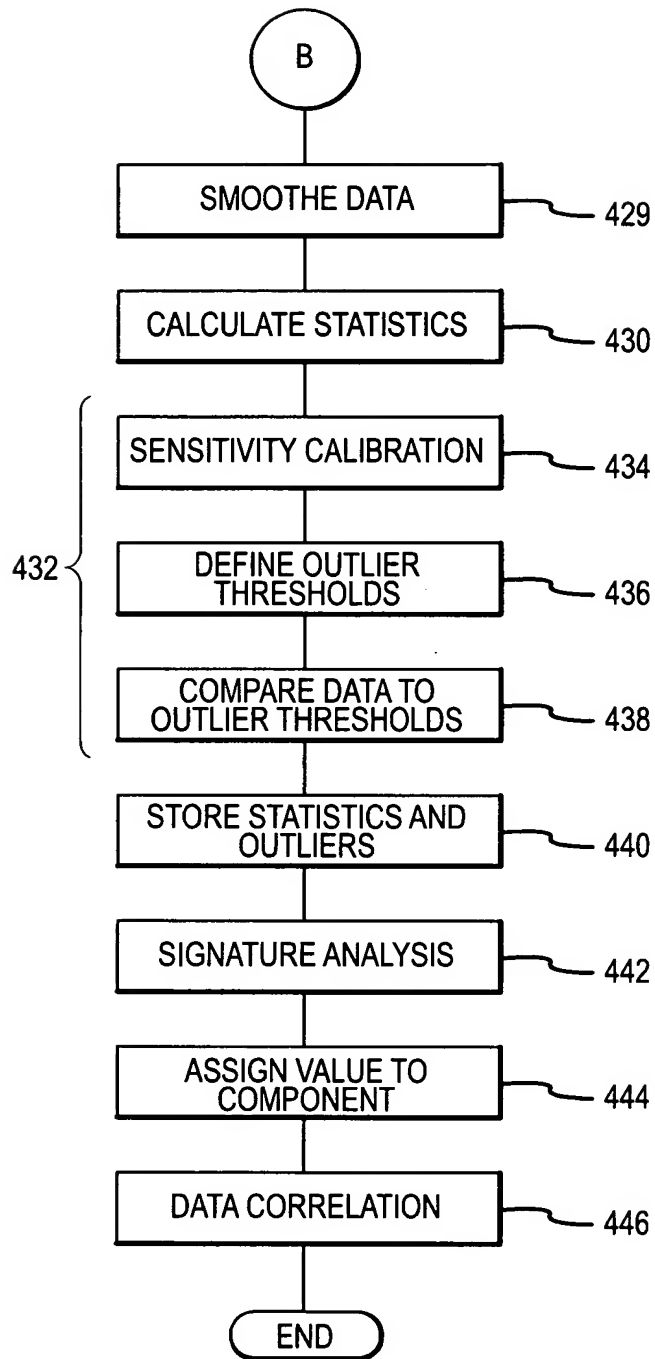


FIG.4C

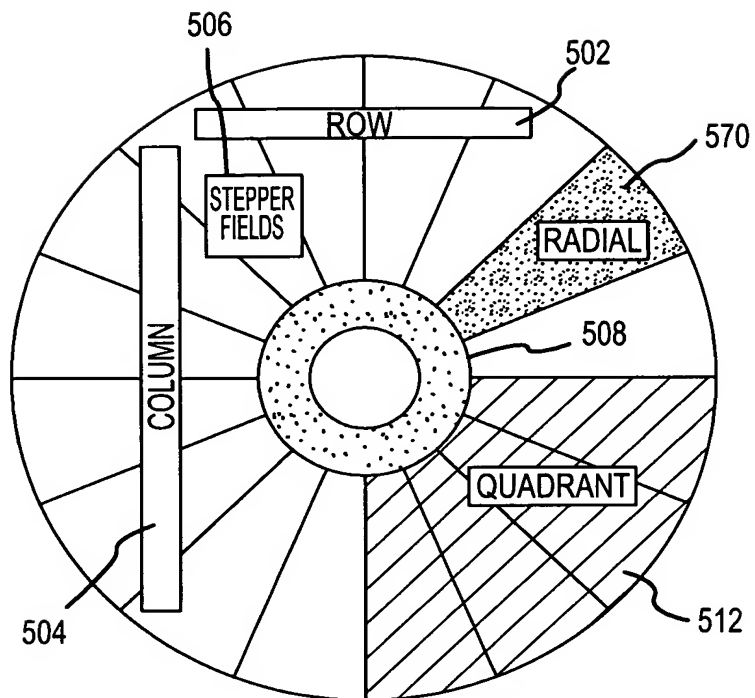


FIG.5

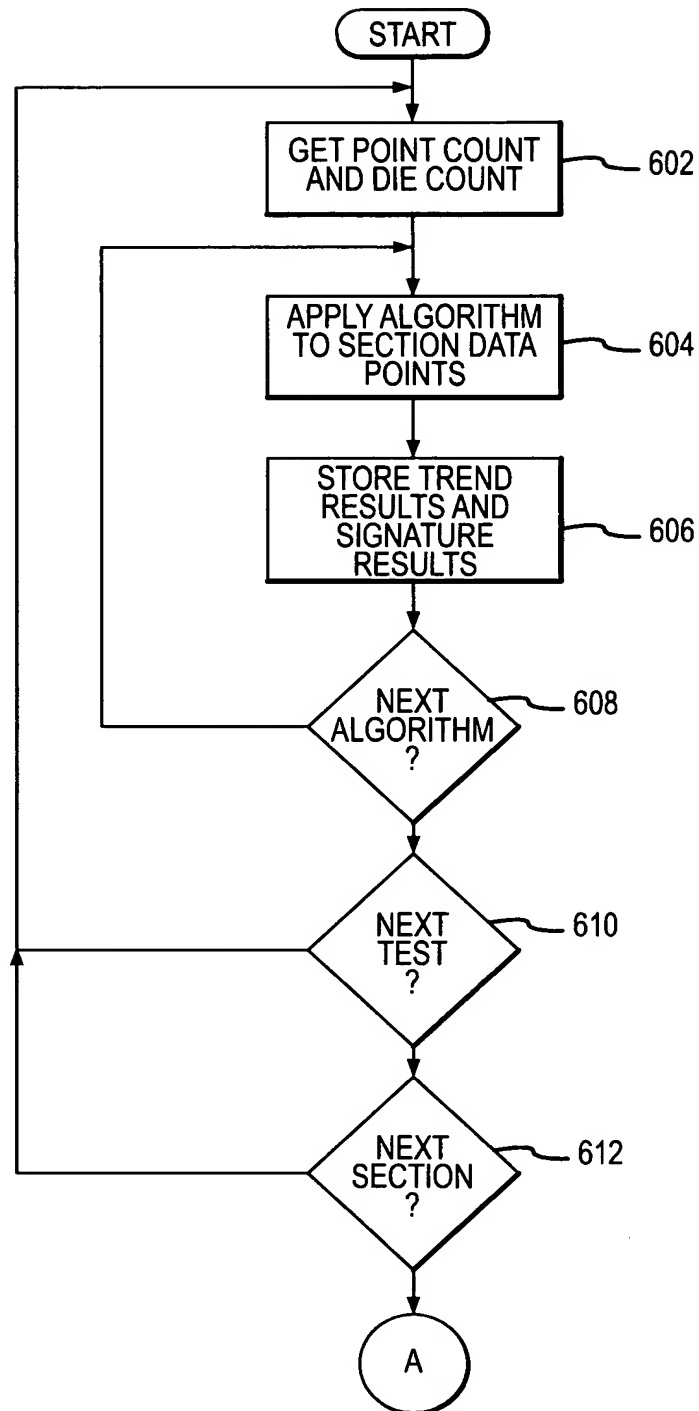


FIG. 6A

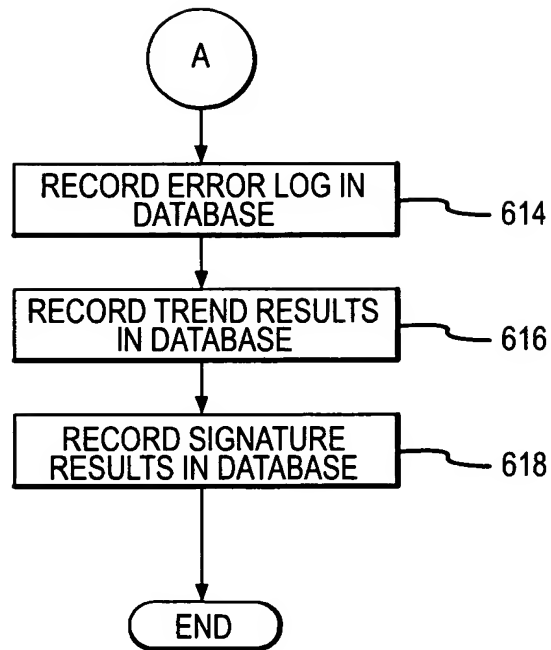


FIG.6B

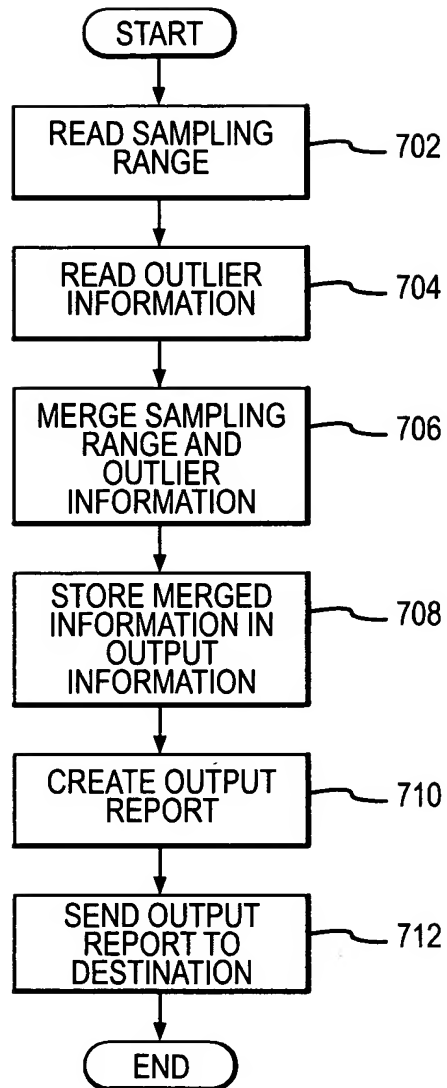


FIG.7

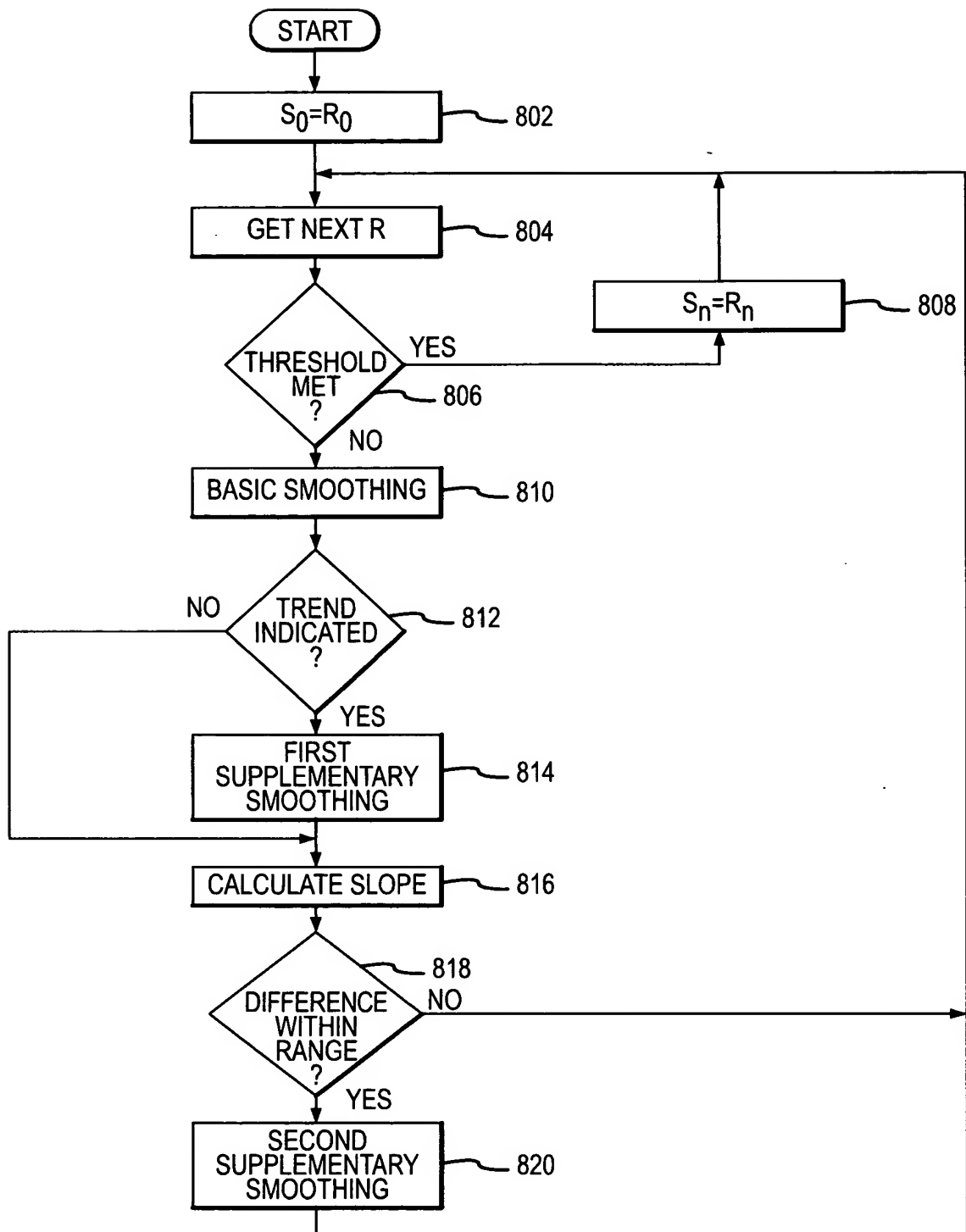


FIG.8

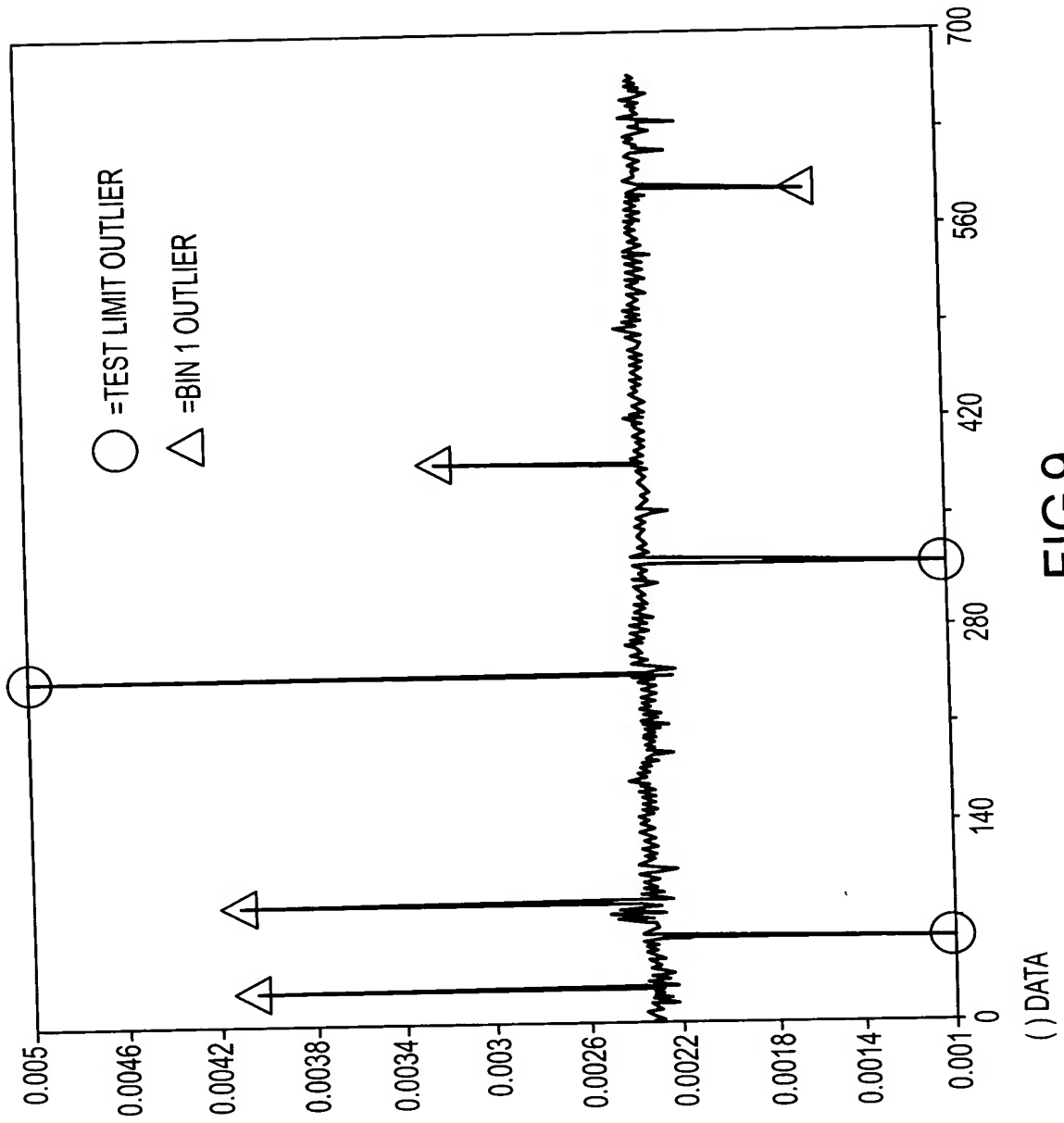
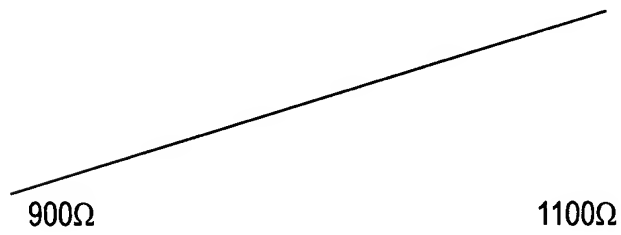
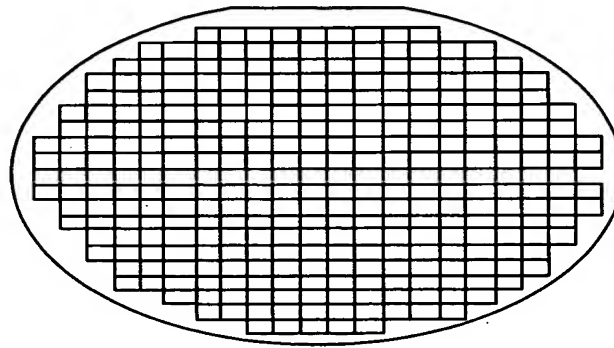


FIG.9

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RESISTIVITY PROFILE

FIG.10

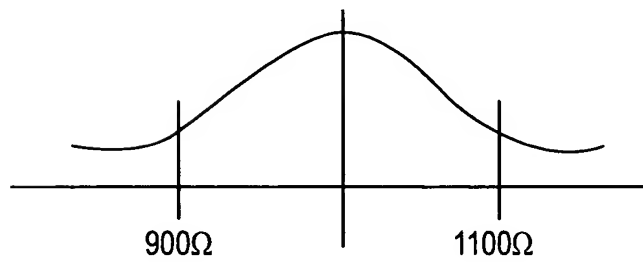


FIG.11

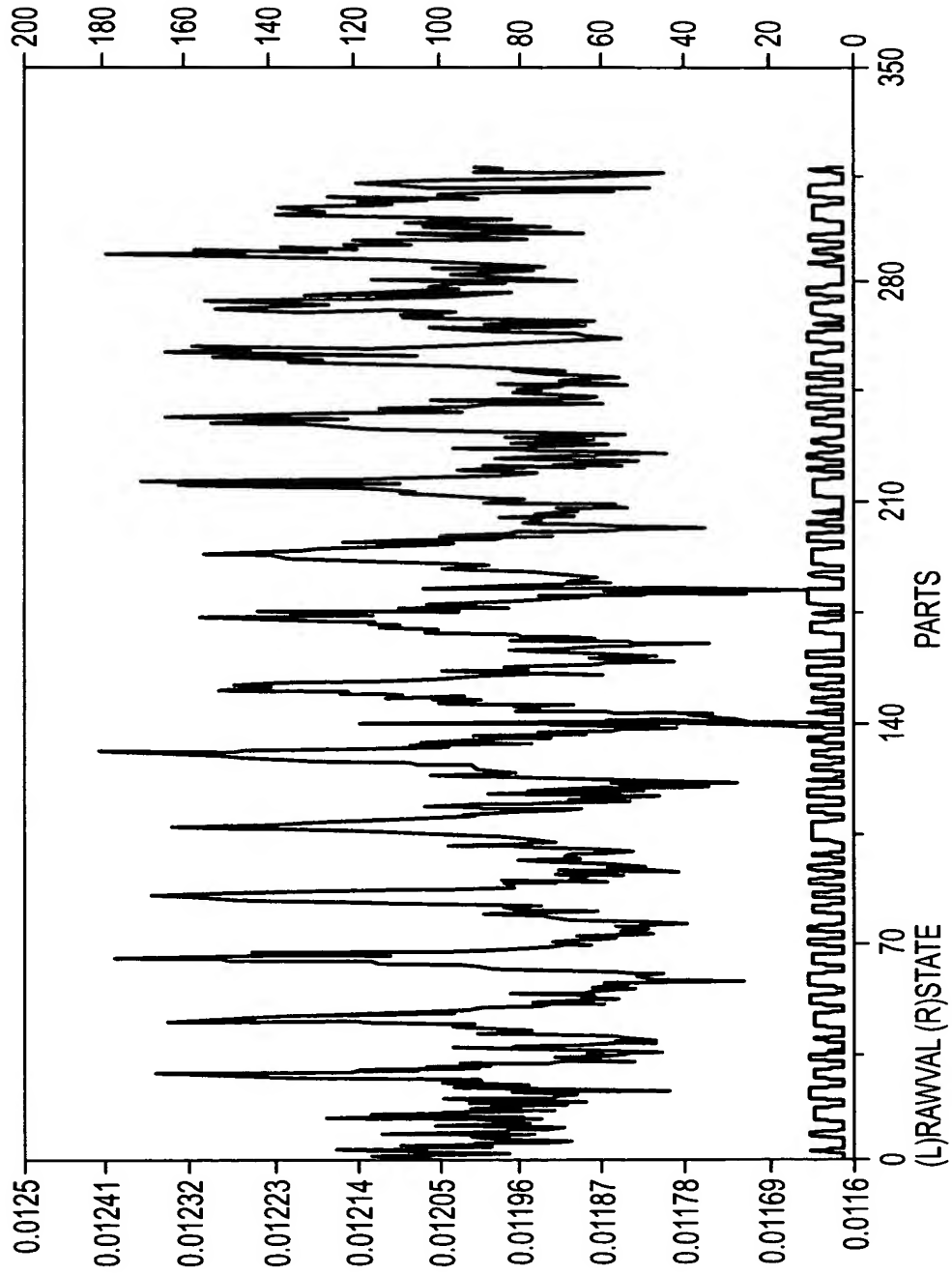


FIG.12A

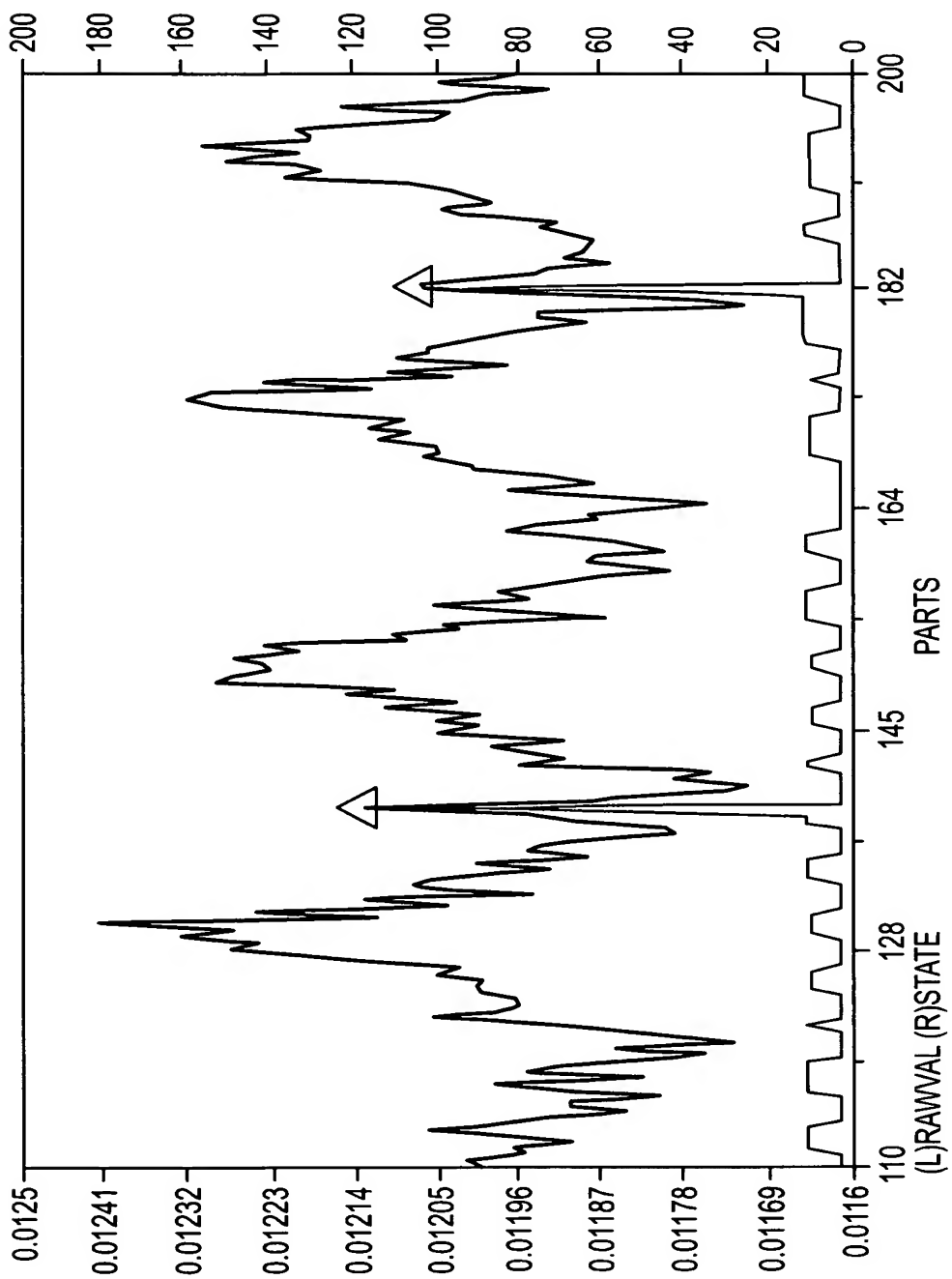


FIG.12B

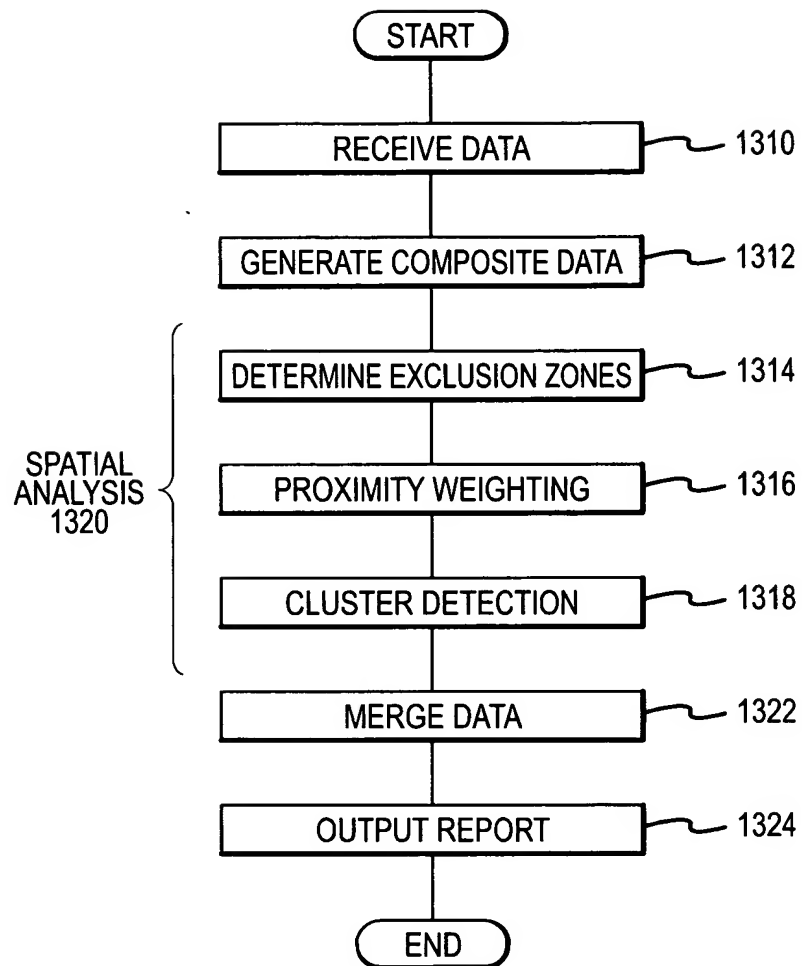
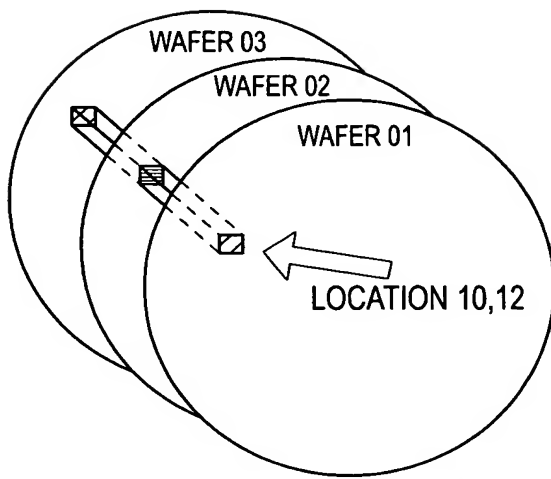


FIG.13

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- ☐ DEVICES WITH VALUE OF 5
- ▣ DEVICES WITH VALUE OF 10

EXAMPLE:

FOR THE LOCATION 10,12 A VARIABLE WITH THE DEFINITION OF FIVE WOULD HAVE A VALUE OF TWO AND A VARIABLE WITH A DEFINITION OF TEN WOULD HAVE VALUE OF ONE.

NOW, ASSUME THAT THE USER HAS A FORMULA OF $X > 1$ AND ALSO ASSUME THAT X IS A VARIABLE WITH A DEFINITION VALUE OF FIVE ACCORDING TO THE DATA, X WOULD HAVE A VALUE OF 2 (AS WE SAW ABOVE) AND THE FORMULA WOULD EQUATE AS TRUE. SINCE THE FORMULA RESULTED IN A TRUE VALUE, IT WOULD BE INCLUDED IN THE COMPOSITE MAP.

FIG.14

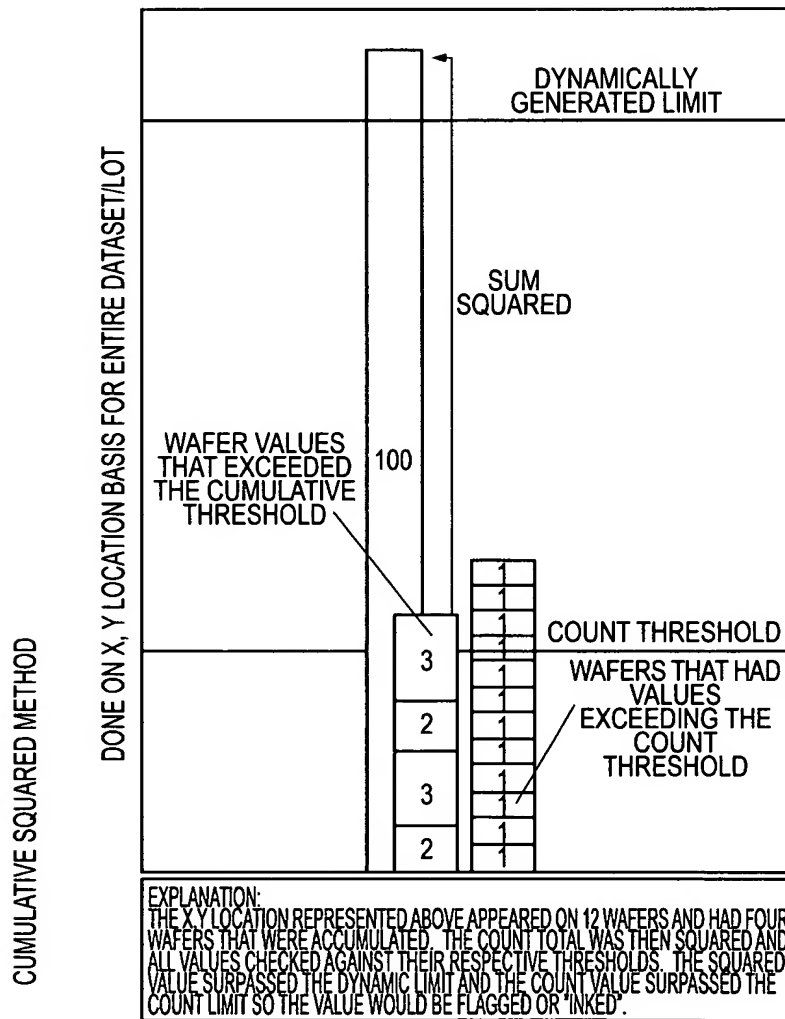


FIG.15C

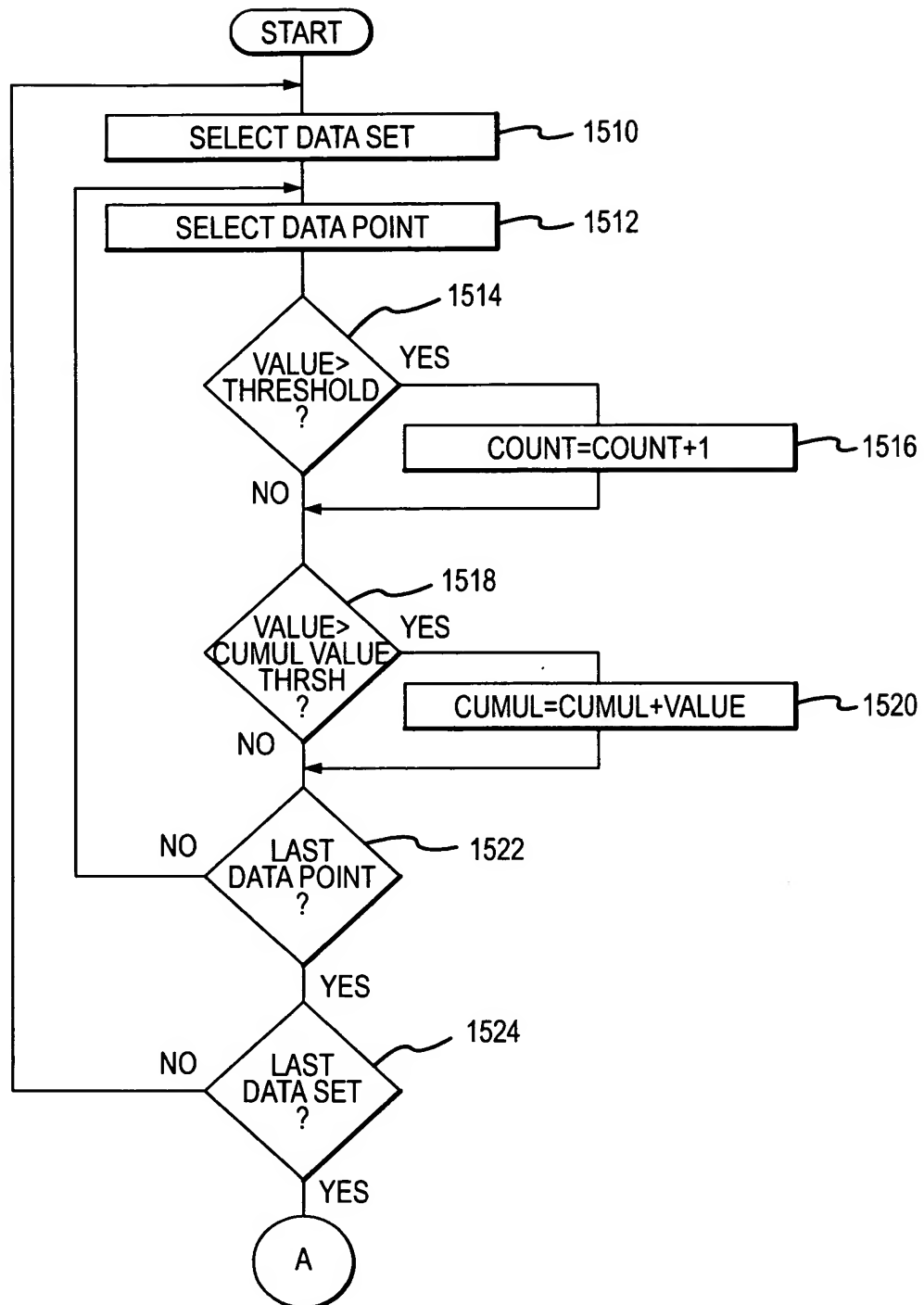


FIG. 15A

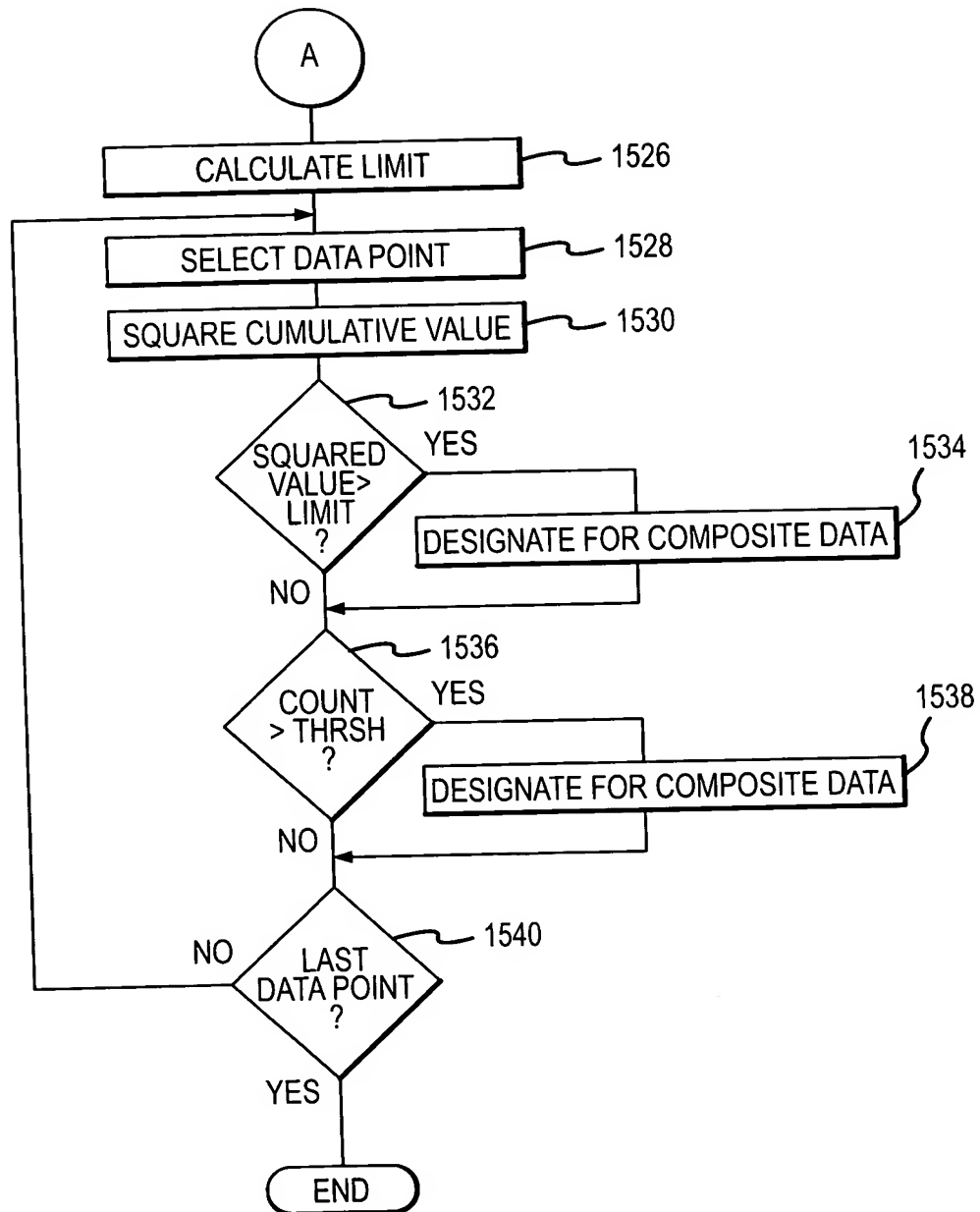


FIG.15B

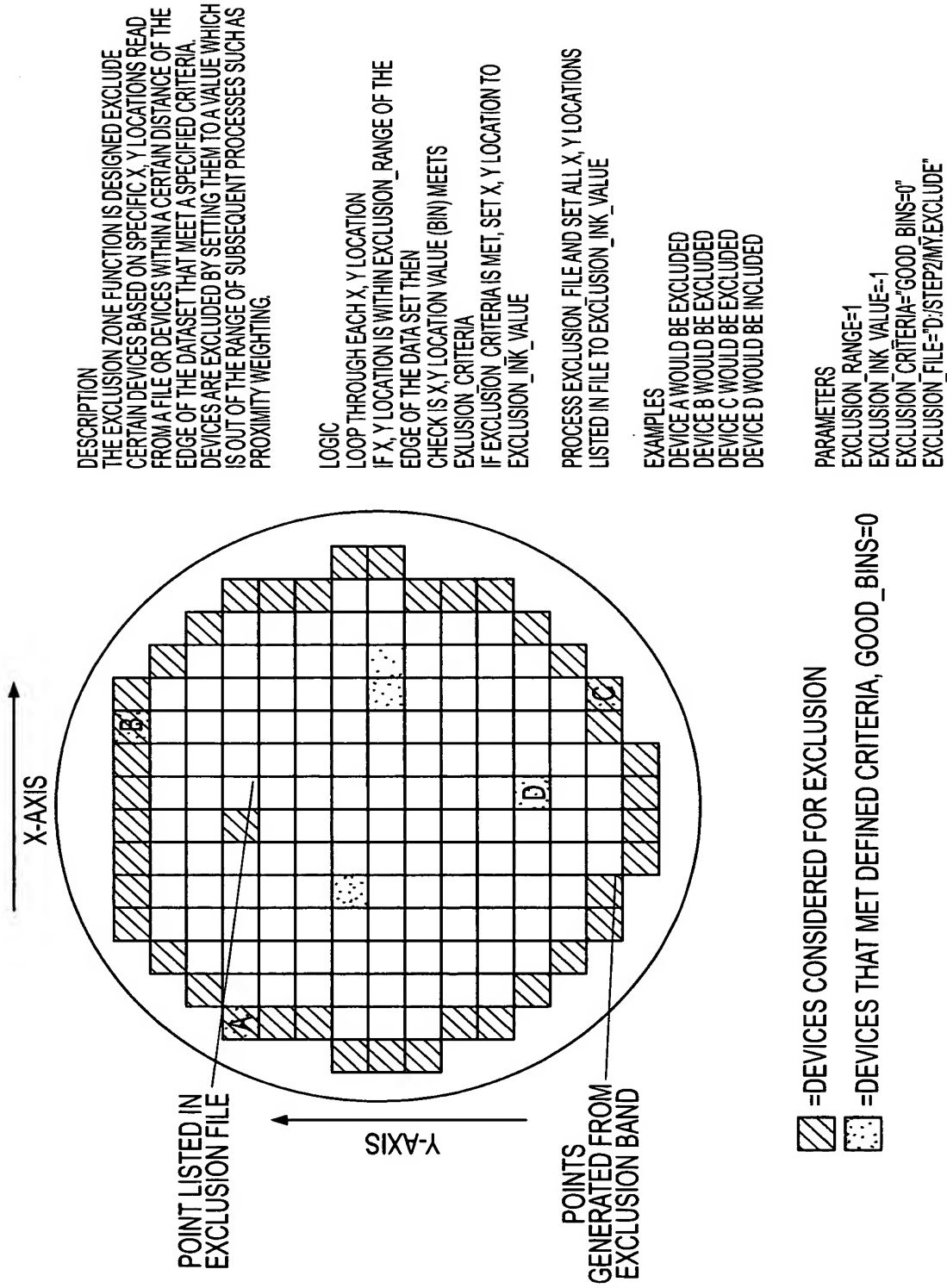


FIG.16

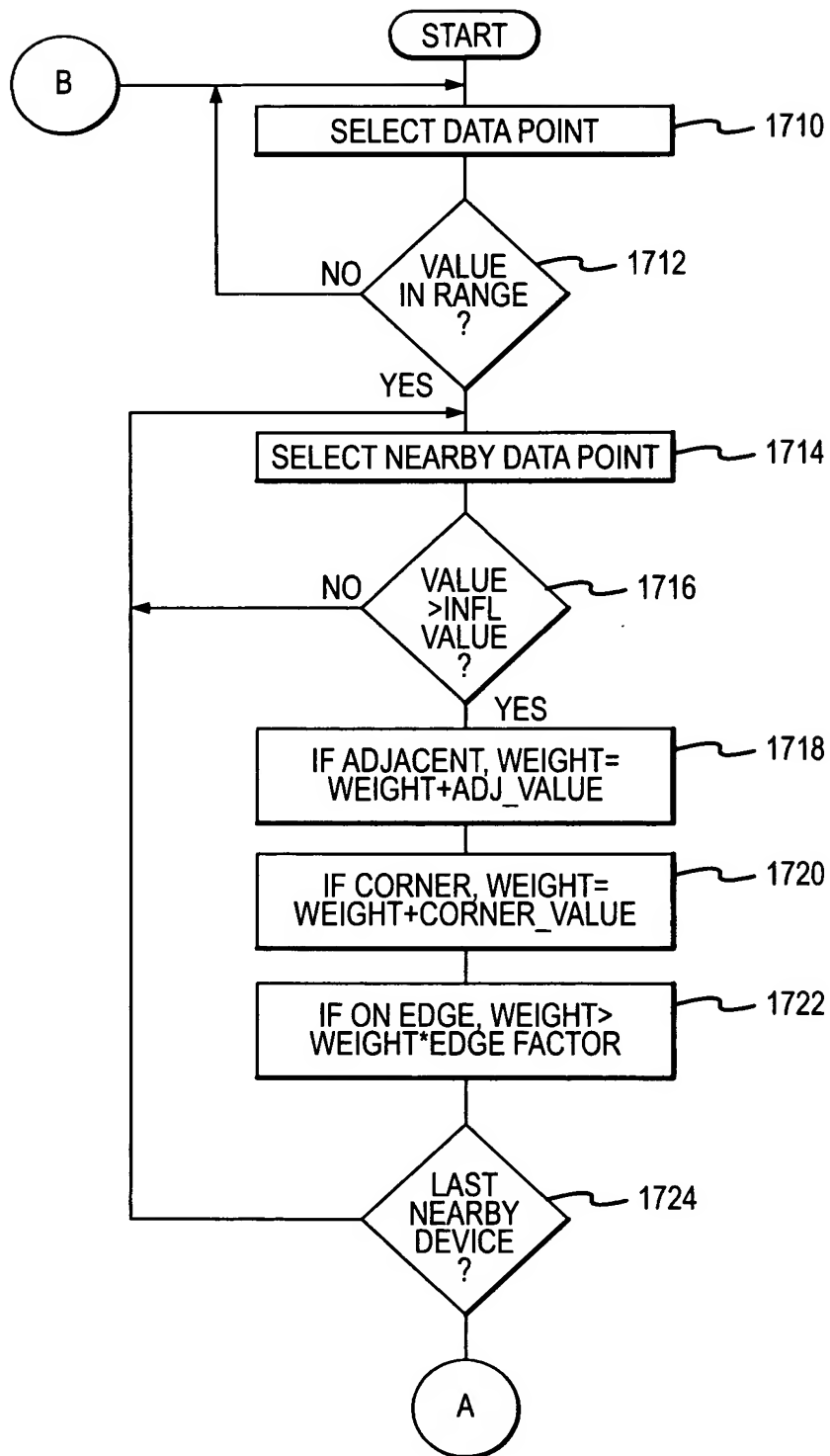


FIG. 17A

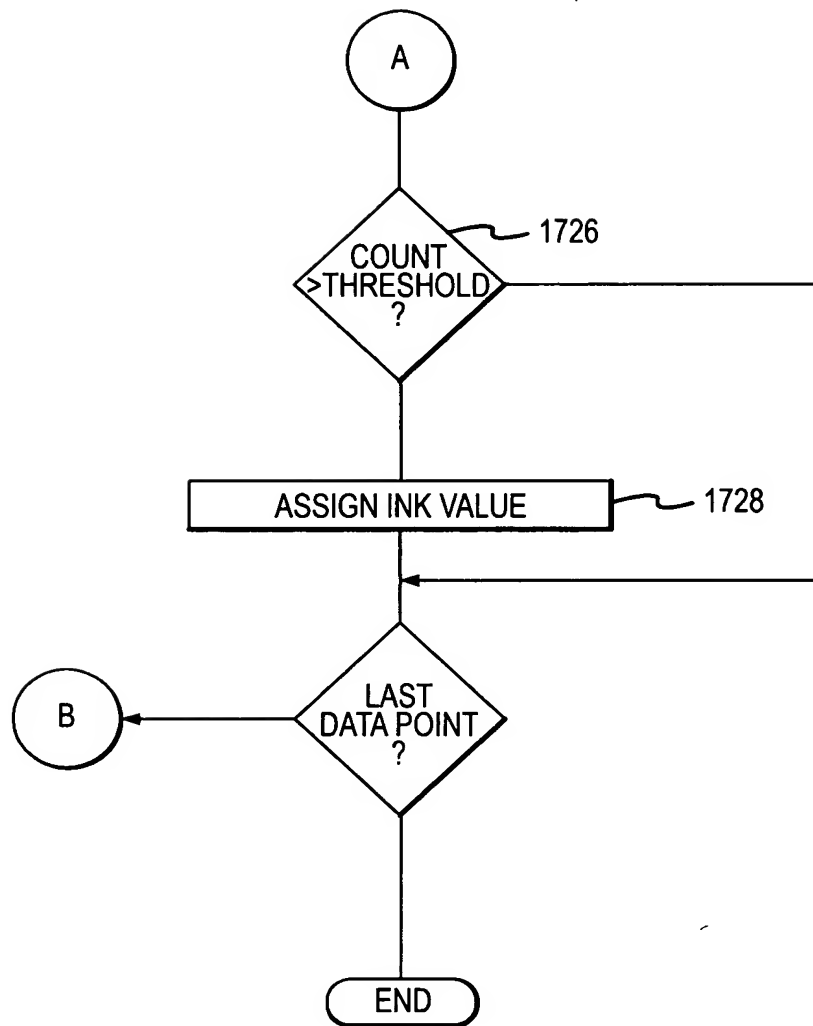


FIG. 17B

DESCRIPTION
PROXIMITY WEIGHTING REVIEWS ALL DATA POINTS IN A DATA SET ARRANGED IN X, Y FASHION AND ANALYZES THE POINTS THAT HAVE VALUES WITHIN A SPECIFIED RANGE. ANALYSIS CONSISTS OF SEARCHING AN AREA, RADIUS OF SPECIFIED UNITS, AROUND EACH DEVICE AND LOOKING FOR DEVICES THAT ARE ABOVE A CERTAIN THRESHOLD. IF A DEVICE IS FOUND THAT HAS A VALUE ABOVE A SAID THRESHOLD, THEN IT EITHER LENDS A SPECIFIED WEIGHT TO THE DEVICE BEING ANALYZED. WEIGHT DEPENDS IF THE DEVICE IS ADJACENT OR DIAGONAL TO THE DEVICE BEING ANALYZED.

LOGIC
LOOP THROUGH EACH X, Y LOCATION
IF X, Y LOCATION HAS VALUE BETWEEN UPPER_BOUND AND LOWER_BOUND
CHECK ALL DEVICES IN THE SPECIFIED SEARCH RANGE (SEE LEGEND)
IF DEVICE IN SEARCH RANGE BEING CHECKED HAS A VALUE THAT MEETS OR EXCEEDS THE INFLUENCE_VALUE THEN
IF DEVICE IS ADJACENT, INCREMENT X, Y LOCATION COUNT BY ADJACENT_VALUE ELSE INCREMENT X, Y LOCATION COUNT BY CORNER_VALUE
IF X, Y LOCATION IS ON EDGE OF DATASET THEN MULTIPLY BY X, Y LOCATION COUNT BY EDGE_FACTOR
IF X, Y LOCATION COUNT EXCEEDS THRESHOLD, ASSIGN X, Y LOCATION A VALUE OF INK_VALUE

EXAMPLES
1. COUNT=2, END RESULT=1
2. COUNT=6, END RESULT=20
3. COUNT=0, END RESULT=1
4. COUNT=6, END RESULT=20

PARAMETERS
THRESHOLD=4
ADJACENT_VALUE=2
CORNER_VALUE=1
EDGE_FACTOR=1
PROX_RANGE=1
UPPER_BOUND=30
LOWER_BOUND=0
INK_VALUE=20
INFLUENCE_VALUE=30

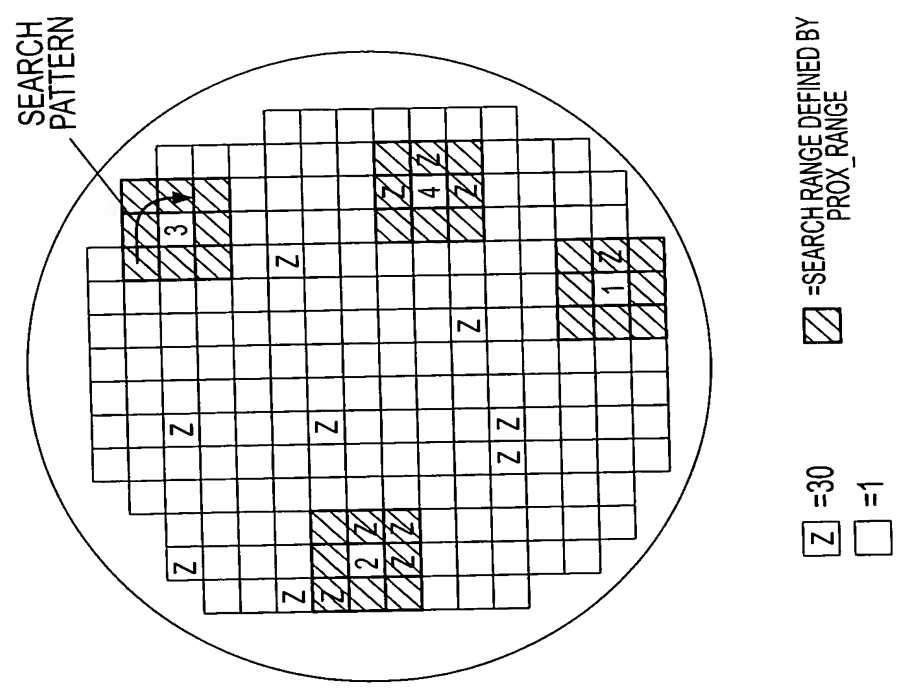


FIG.18

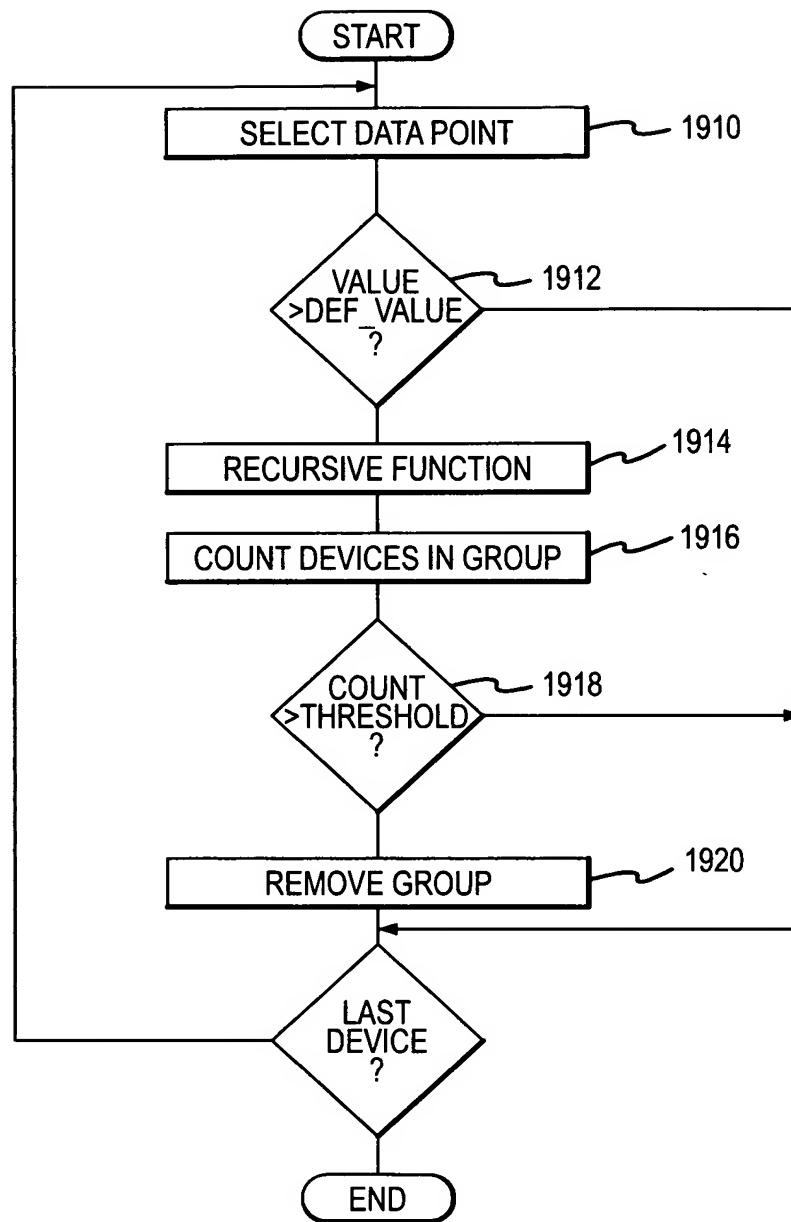


FIG.19

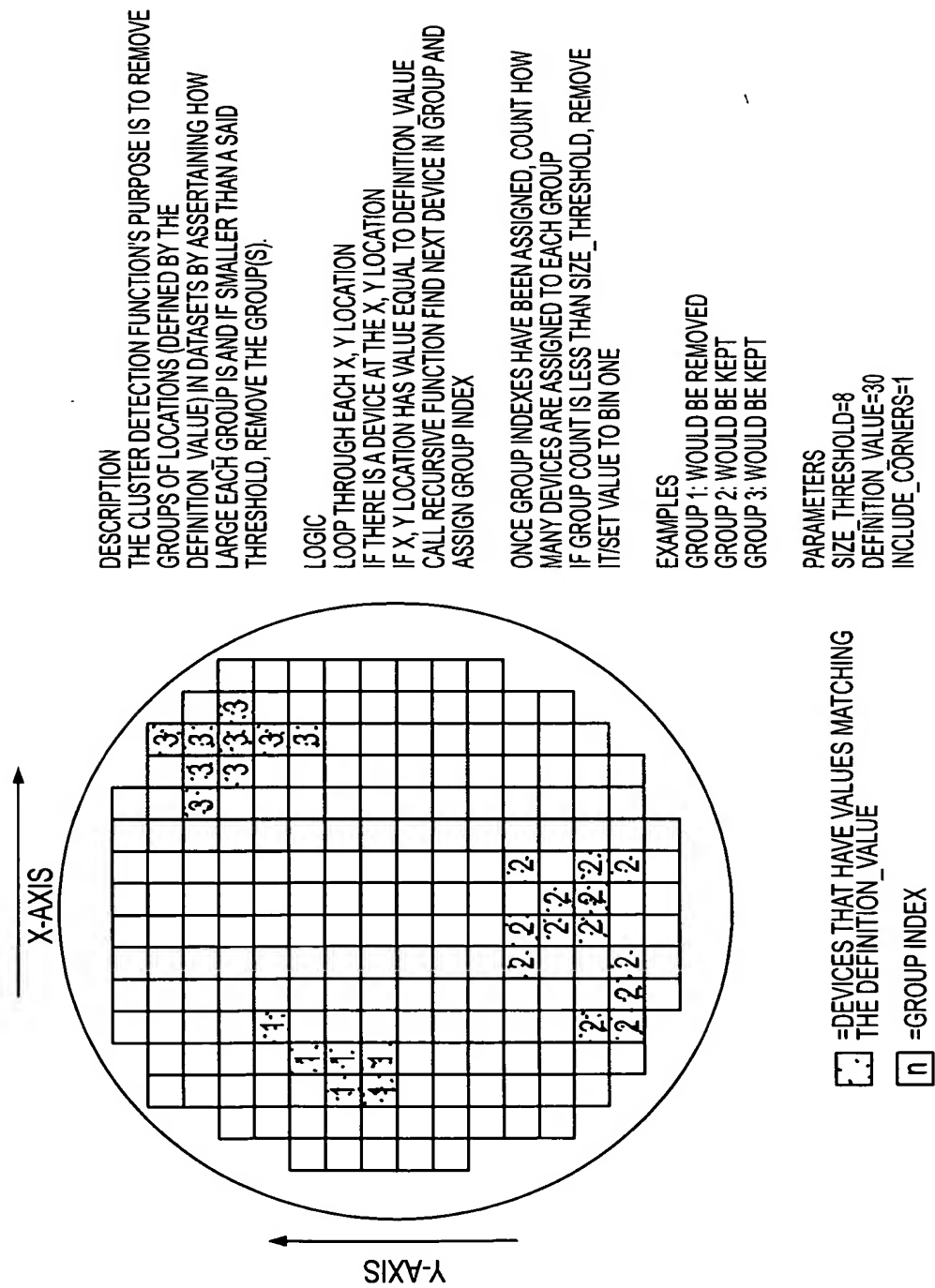
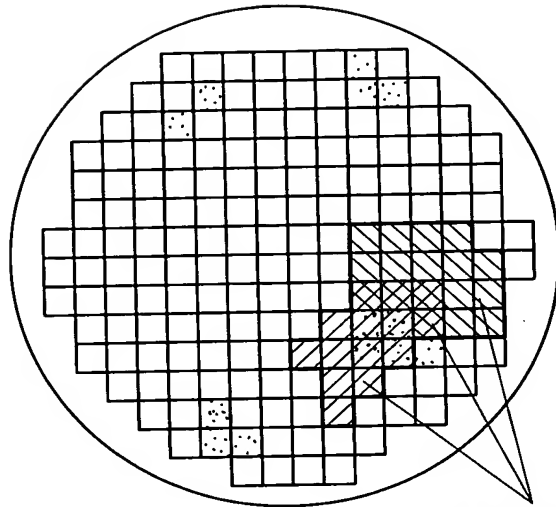






FIG.20



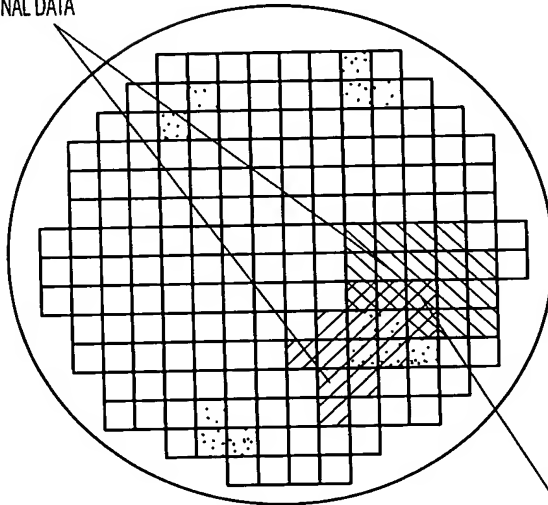
-  TESTER BIN FAILURES IN ORIGINAL DATA
-  FAILURE PATTERN IN COMPOSITE MAP 1
-  FAILURE PATTERN IN COMPOSITE MAP 2
-  COMPOSITE MAPS OVERLAP





DESCRIPTION:
LOOKING AT THE EXAMPLE TO THE LEFT, NOTICE THAT THERE ARE TWO COMPOSITE MAP PATTERNS, LABELED ONE AND TWO. ANY POINTS FROM EITHER PATTERN ARE MERGED IN THIS TYPE OF MERGE OPERATION.

COMPOSITE (MANY WAFERS)
DATA POINTS WILL BE MERGED
INTO ORIGINAL DATA (FOR A
SINGLE WAFER)

FIG.21

DATA POINT WILL NOT
BE MERGED INTO
ORIGINAL DATA

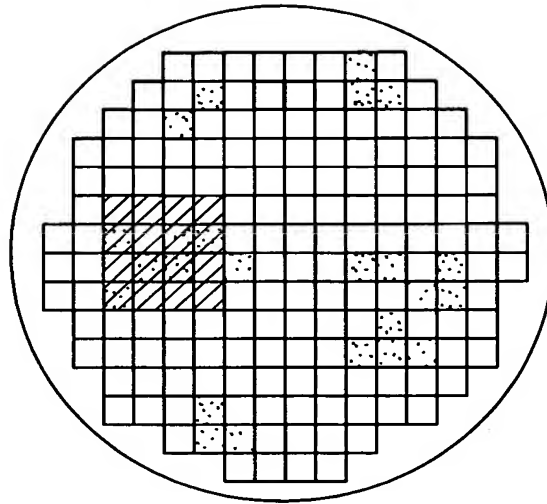


-  TESTER BIN FAILURES IN ORIGINAL DATA
-  FAILURE PATTERN IN COMPOSITE MAP 1
-  FAILURE PATTERN IN COMPOSITE MAP 2
-  COMPOSITE MAPS OVERLAP

DESCRIPTION:
LOOKING AT THE EXAMPLE TO THE LEFT, NOTICE THAT THERE ARE TWO COMPOSITE MAP PATTERNS, LABELED ONE AND TWO. NOTICE THAT THERE IS AN AREA WHERE THE TWO PATTERNS OVERLAP. IT IS THIS AREA AND ONLY THIS AREA OF OVERLAP THAT WILL BE MERGED INTO THE ORIGINAL DATA, THE REST OF THE PATTERN IS DISCARDED.

DATA POINT WILL BE
MERGED INTO
ORIGINAL DATA

FIG.22



TESTER BIN FAILURES IN ORIGINAL DATA

FAILURE PATTERN IN COMPOSITE MAP

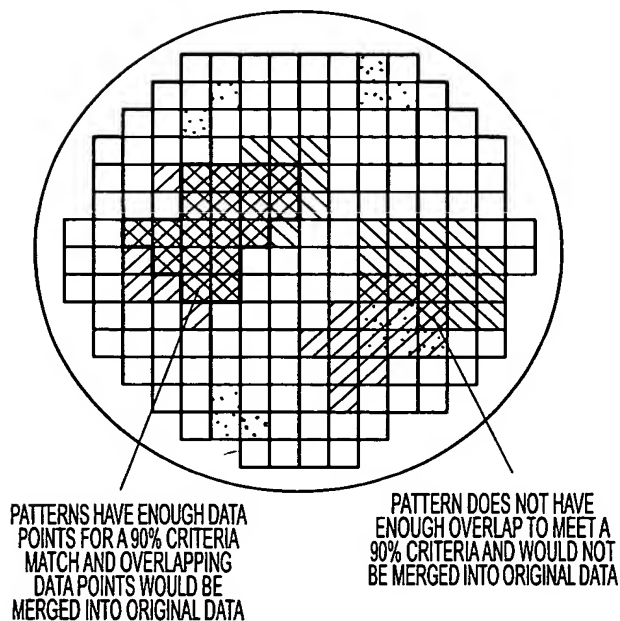
PATTERN CONSTITUTION MODE

GIVEN THE EXAMPLE ON THE TOP LEFT AND ASSUMING THAT THE USER HAS SET THE CRITERIA FOR A PATTERN MERGE IS THAT AT LEAST 50% OF THE COMPOSITE MAP PATTERN MUST MATCH THE ORIGINAL DATA WE CAN SEE THAT THE COMPOSITE PATTERN WOULD NOT BE MERGED ON THE ORIGINAL DATA. THIS IS DUE TO THE FAILURE OF THE DATA TO PASS THE CRITERIA SPECIFIED. AT LEAST 8 OUT OF THE 16 DATA POINT PATTERN MUST HAVE CORRESPONDING POINT ON THE ORIGINAL DATA, OF WHICH THERE ARE ONLY SIX. SINCE THE PATTERN FAILED THE CRITERIA IT WILL NOT BE MERGED WITH THE ORIGINAL DATA.

ABSOLUTE MODE

IN THIS MODE, THE EXAMPLE TO THE LEFT WOULD HAVE THE COMPOSITE MAP SUPERIMPOSED OVER THE ORIGINAL DATA MAP REGARDLESS OF HOW MUCH OF THE PATTERN IS REPRESENTATIVE OF THE ACTUAL DATA.

FIG.23



TESTER BIN FAILURES IN ORIGINAL DATA

FAILURE PATTERN IN COMPOSITE MAP 1

FAILURE PATTERN IN COMPOSITE MAP 2

COMPOSITE MAPS OVERLAP

DESCRIPTION:

LOOKING AT THE EXAMPLE TO THE LEFT, NOTICE THAT THERE ARE TWO COMPOSITE MAP PATTERNS, LABELED ONE AND TWO. NOTICE THAT THERE IS AN AREA WHERE THE TWO PATTERNS OVERLAP. IT IS THIS AREA AND ONLY THIS AREA OF OVERLAP THAT WILL BE MERGED INTO THE ORIGINAL DATA IF AND ONLY IF A USER DEFINED CRITERIA IS MET. THIS CRITERIA COULD BE A FIXED THRESHOLD, 15 FOR INSTANCE OR A CALCULATED VALUE SUCH AS 90% OF THE DATA POINTS CONSTITUTING THE PATTERNS MUST OVERLAP. IN EITHER CASE, THE OVERLAP ON THE UPPER LEFT PORTION OF THE DIAGRAM WOULD HAVE SUFFICIENT OVERLAP AND WOULD BE MERGED BUT THE OVERLAP ON THE RIGHT OF THE DIAGRAM HAS ONLY FOUR DEVICES AND WOULD NOT BE MERGED.

PATTERNS HAVE ENOUGH DATA POINTS FOR A 90% CRITERIA MATCH AND OVERLAPPING DATA POINTS WOULD BE MERGED INTO ORIGINAL DATA

PATTERN DOES NOT HAVE ENOUGH OVERLAP TO MEET A 90% CRITERIA AND WOULD NOT BE MERGED INTO ORIGINAL DATA

NOTE: IT IS ALSO POSSIBLE THAT INSTEAD OF MERGING ONLY THE OVERLAPPING PATTERNS THAT ALL PATTERNS ARE MERGED REGARDLESS OF THE CRITERIA AND THE DATA POINTS THAT DO MEET THE CRITERIA ARE ONLY NOTED IN AN OUTPUT FILE.

FIG.24

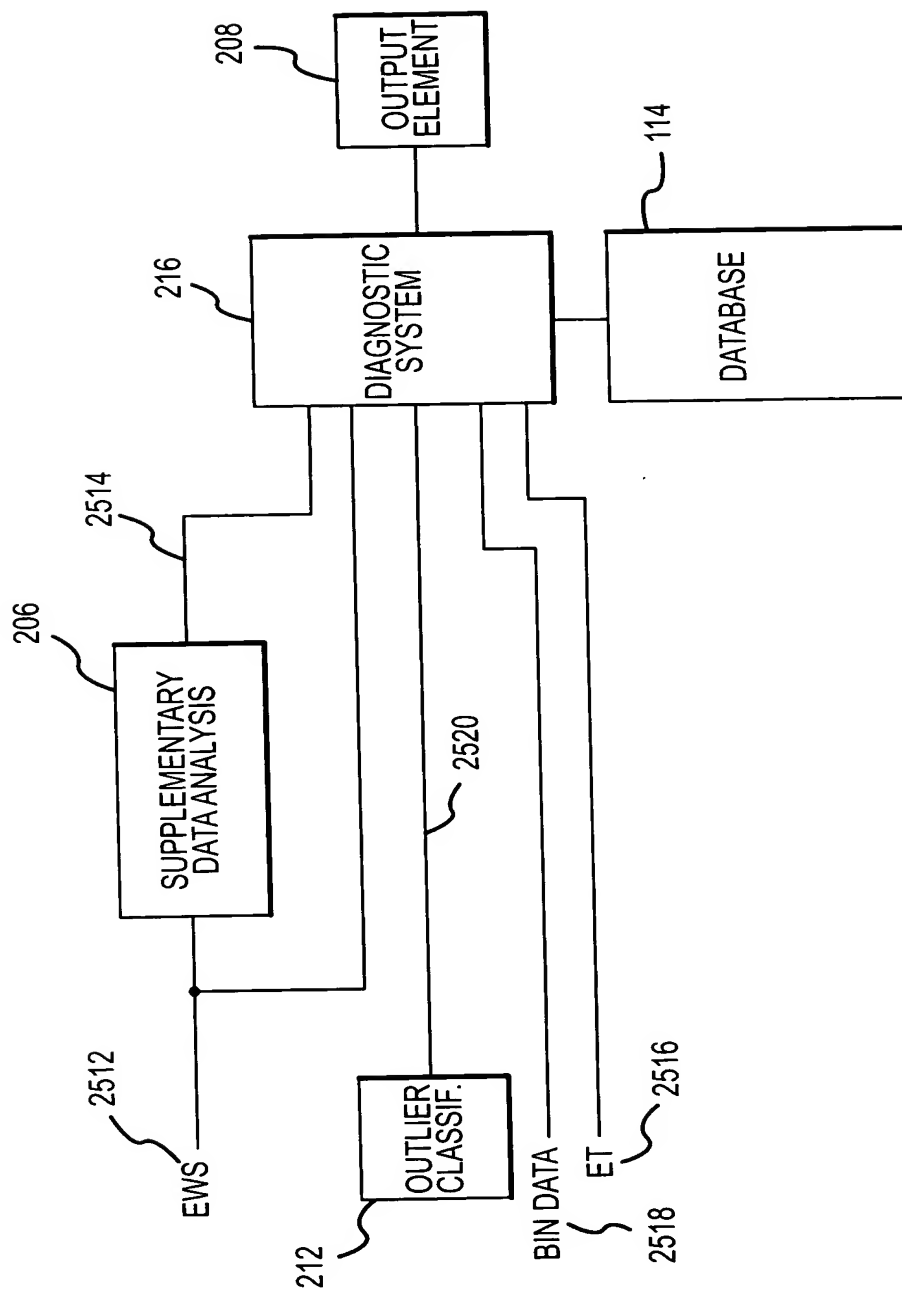


FIG.25

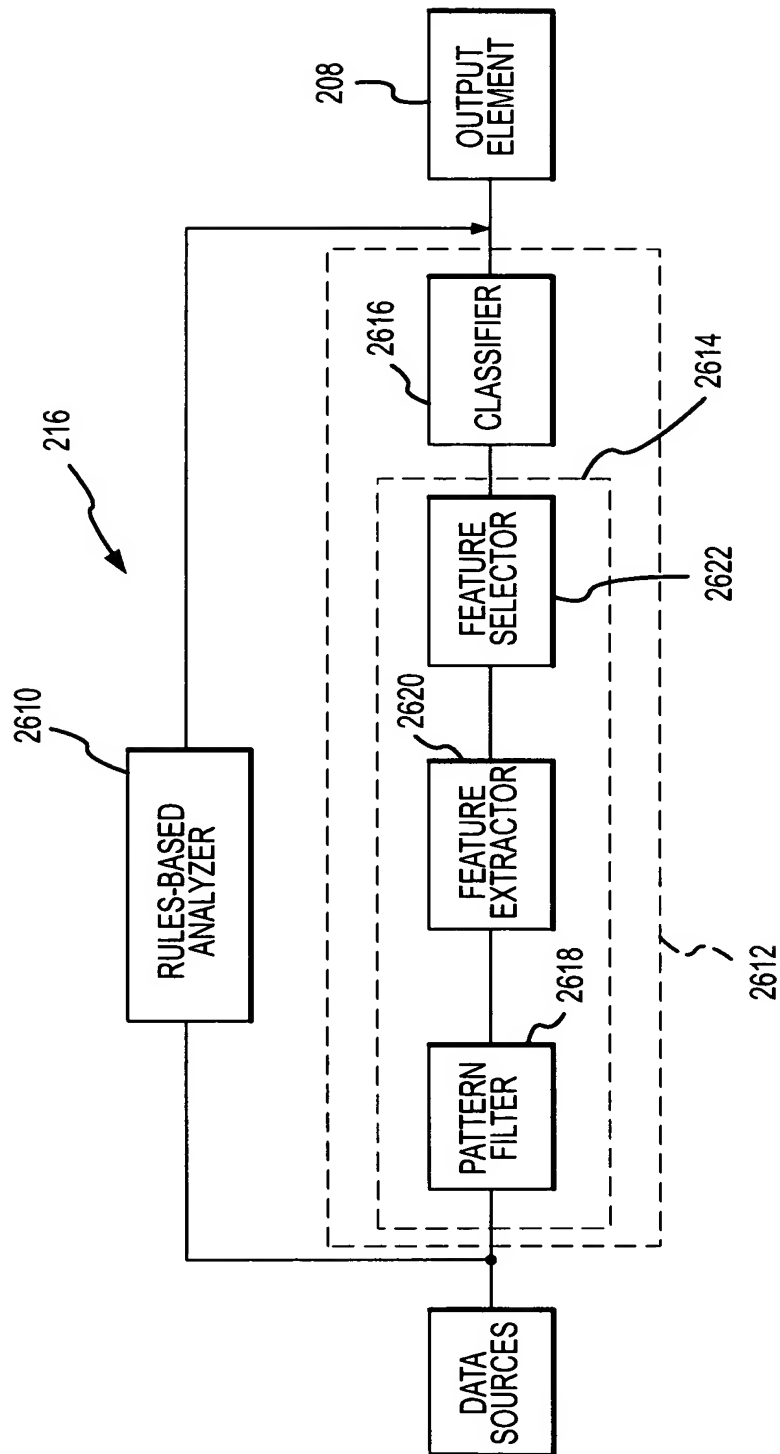


FIG.26

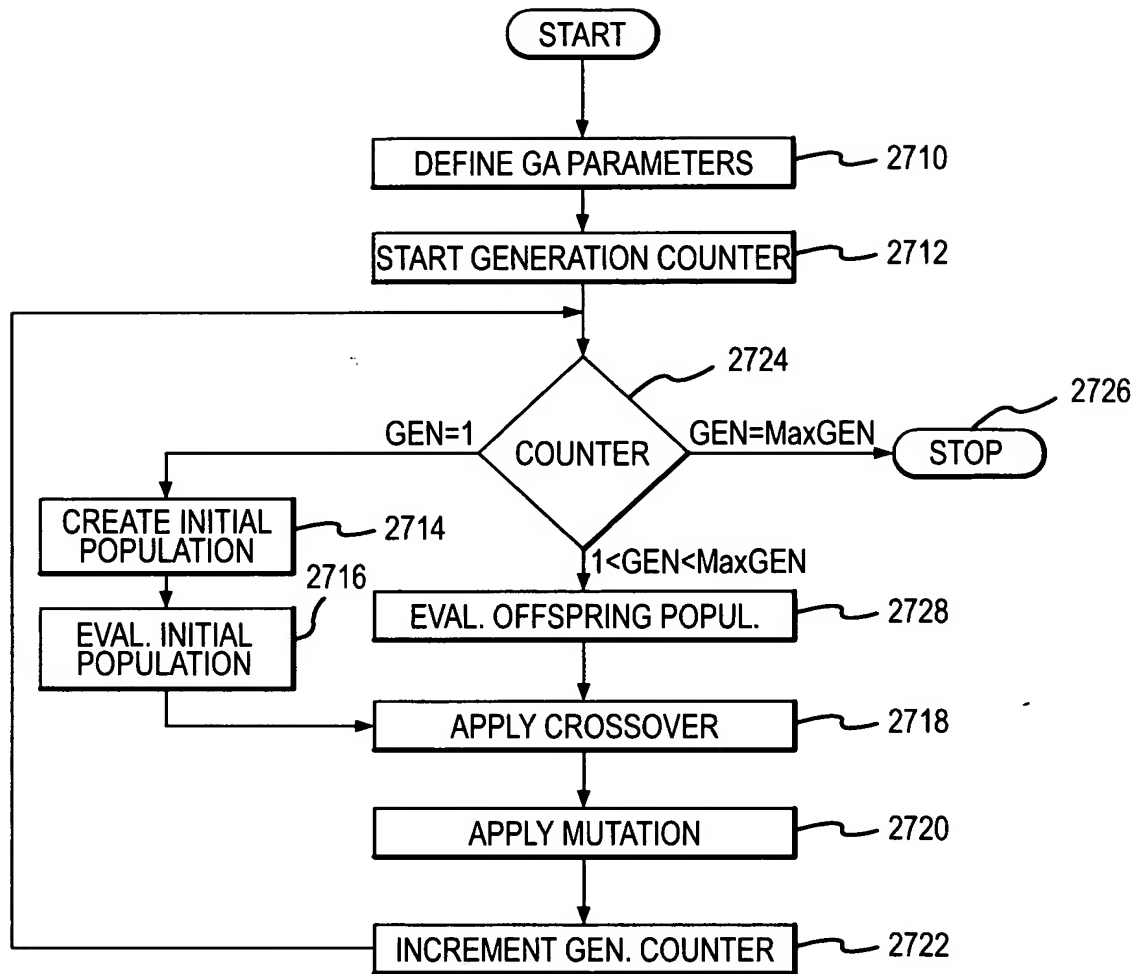


FIG.27

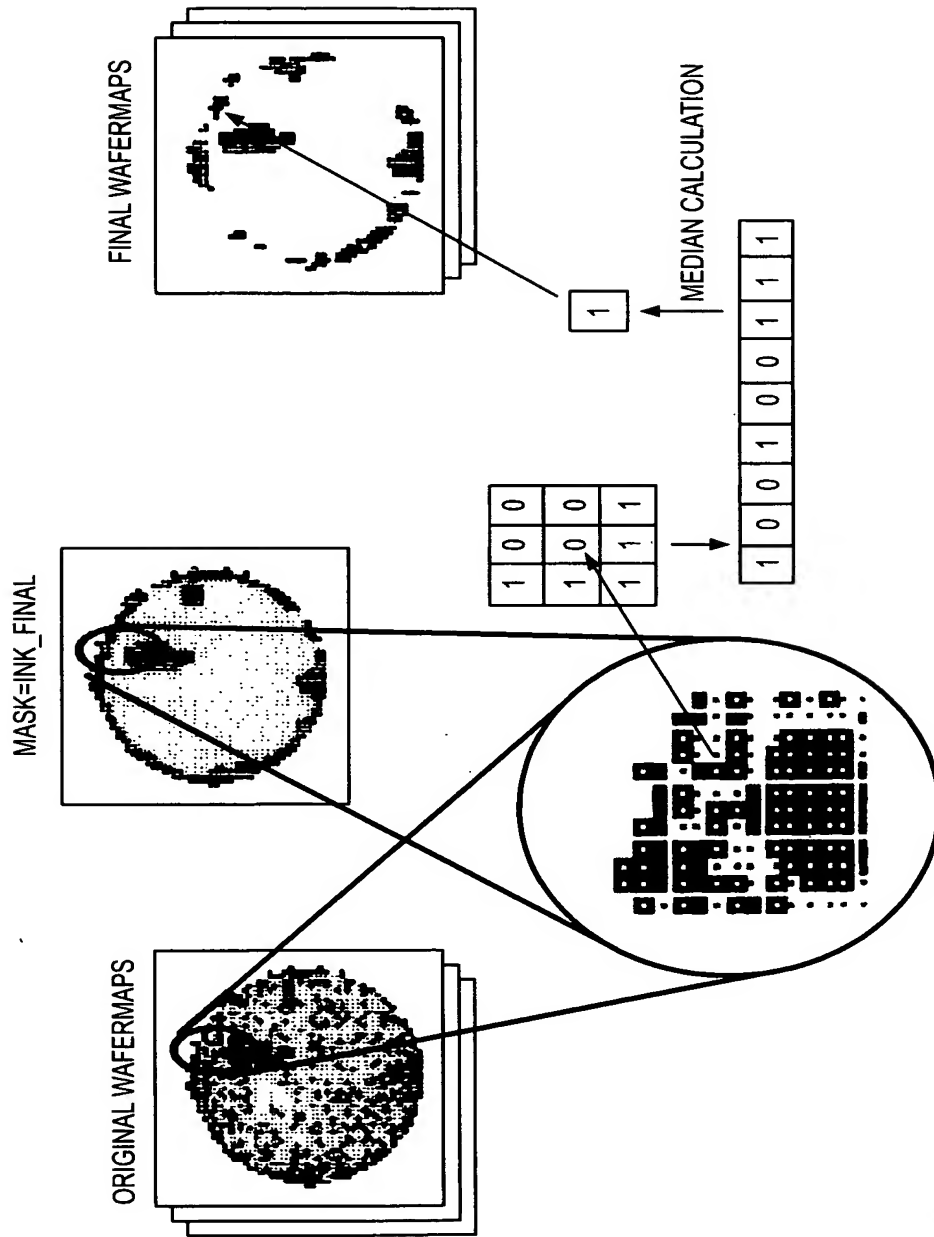


FIG.28

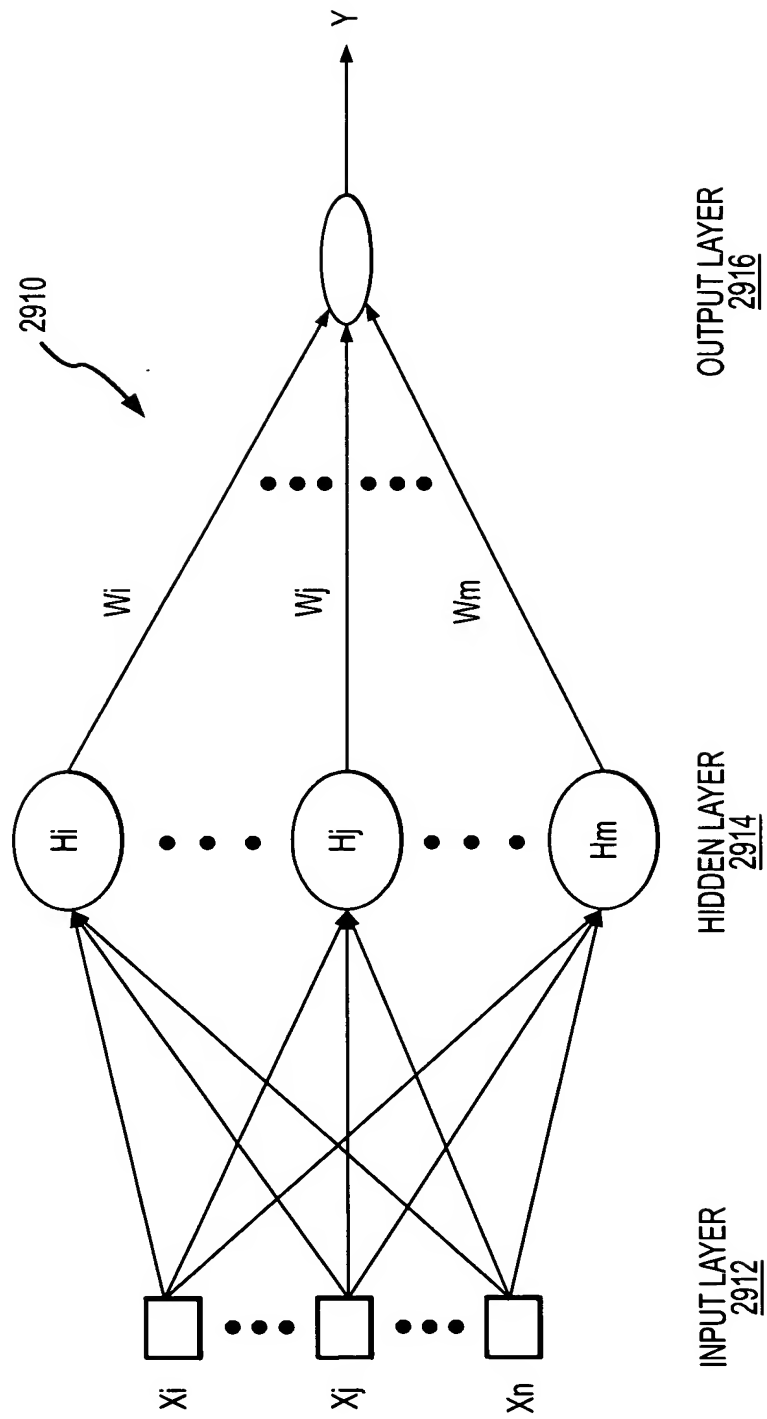


FIG.29